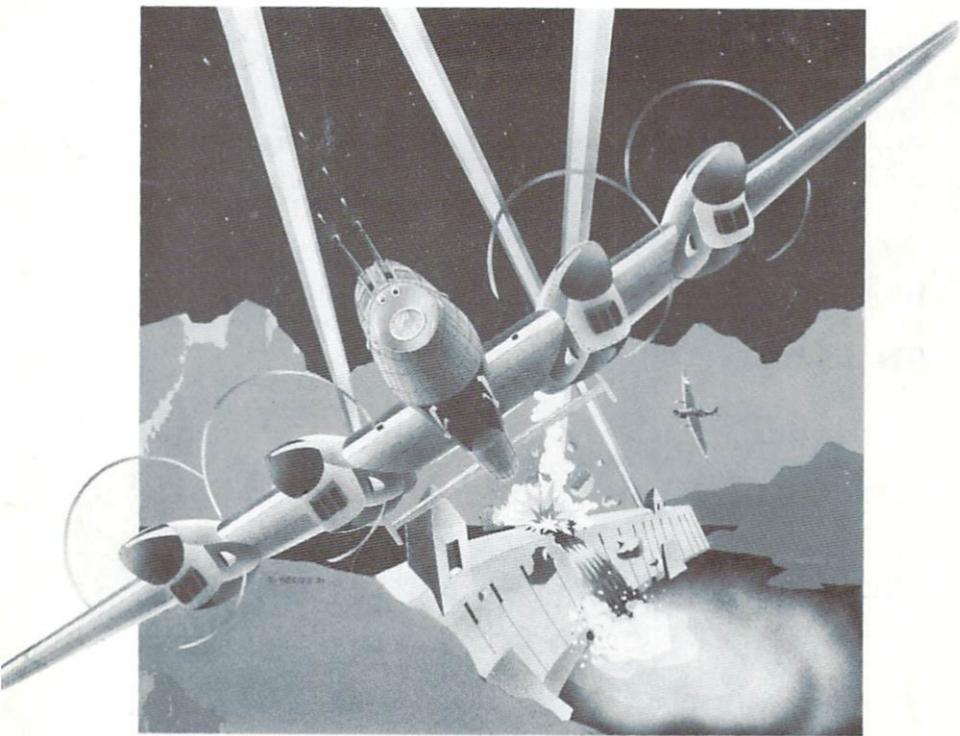


# THE DAM BUSTERS



from  
**ACCOLADE**

for Commodore 64/128

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# THE DAM BUSTERS

I'm sitting with 20 other pilots in condemned WWI temporary housing. The English wind, this early spring evening in 1943, is bitter cold. Half the men don't have on proper squadron uniforms.

The Wing Commander rises slowly, and begins the briefing in a deliberate voice. "Gentlemen, you all know a good deal about the danger of low-level bombing. Well, all that's a tea cake next to what we've got on. Our mission is to fly in at 60 feet and bomb three dams that provide most of the water for the chief concentration of German industrial production in the Ruhr Valley."

It's been two and half years since the Battle of Britain, when the Luftwaffe outnumbered the RAF five to one, when they blitzed London, and still they were beaten back. Churchill's words rang in all our ears:

"We shall go on to the end, we shall fight in France, we shall fight on the seas and oceans, we shall fight with growing confidence and growing strength in the air, we shall defend our island, whatever the cost may be, we shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender."

But, the Germans are still entrenched on the continent and another supreme effort is required if we are to throw them back the final time.

The Wing Commander went on: "These are three of the most vital targets in Germany, deep inside their border. You will be flying modified Lancaster bombers and have to navigate without error, repell enemy fighters and barrage balloons, and then drop a massive underwater bomb under the most exacting conditions."

So this was it. I listened carefully to every word as he began to describe the detail. On this flight there was no margin for error.



Like the young pilot on that perilous flight of 1943, you will have to focus your mind in the face of danger and perform at the highest levels in order to succeed.

## TO BEGIN

Remove any cartridges and disconnect all peripherals except for one 1541/1571 disk drive and joystick plugged into port two. Turn on your Commodore 64, turn on the drive and insert the disk in the drive. Type: LOAD "\*", 8, 1 and press RETURN. Then type RUN and press RETURN. To restart the game, press RUN/STOP and RESTORE simultaneously. Hit the fire button to leave any title screen, the dam scene after dropping the bomb, or the status screen after being killed.

## OVERVIEW

There are three levels of play:

1. Practice Dam Run (no enemy action)
2. Flight Lieutenant (starts from the English Channel)
3. Squadron Leader (which takes off from Scampton Field)

You should work your way up through the levels.

First you should practice the bombing run itself (level one). There are a number of steps to be done quickly, but enough practice will make this virtually automatic.

Next in difficulty, at the Flight Lieutenant level, you begin over the English Channel. You will man numerous positions in which you navigate, fly the plane, fire the guns and watch your engines. One key is that you must know each of the necessary tasks so well that they can be performed almost instantly. You must also develop a pattern, as real pilots do, for monitoring different operations. Your flight to Germany will be fast and furious. You need to know which things have to be handled immediately, such as barrage balloons and fires in the engines. You will probably spend a good deal of time in the front gunner position. When the pace is too hectic, hit the space bar. This freezes the action and gives you a moment to think until you press the space bar again to continue play.

It will take considerable effort to perfect individual tasks, such as shooting a fighter that is bobbing and weaving while firing at you. Remember the flying ace Baron Von Richthofen (The Red Baron) was a superb bird hunter before the war. In aerial combat you must aim in the same way by leading the target, and shooting where it will be next.

Highest in difficulty is the Squadron Leader level. In taking off from Scampton Field you must set your flaps and engines correctly, then adjust engines and retract flaps and landing gear once in the air. You will fly south from England and you're ready for the rest of the mission: across the English Channel and European continent to the target.

## **TO PLAY**

### **Positions**

In your Lancaster bomber there are eight positions. Press the corresponding number to go to that position.

1. Pilot	6. First Engineer
2. Front Gunner (also Bombardier)	7. Second Engineer (used only on Squadron Leader level)
3. Tail Gunner	8. Status and damage report
4. Bomb Specialist	
5. Navigator	

When a crew member's position is in trouble, his number will flash at the bottom of the screen.

### **Pilot #1**

Use the joystick to bank, climb or dive (it works the same as in a real Lancaster). The lights on the horizon, and the horizon gauge (second from the right) let you know the orientation of the plane. From the pilot's position you can see approaching barrage balloons, fighters and search lights (which you also see from the front gunner position).

The altimeter gauge on the left shows your altitude. When both needles are straight up (12 o'clock) you're on the ground. Each quadrant (15 minute mark) indicates 500 feet for the small hand and 25 feet for the larger hand. Thus, six o'clock equals 1000 feet. Plan to fly between 100 and 1000 feet—high enough to avoid the ground and still lower than enemy radar can readily pick you up.

The compass gives your correct heading and the dark reddish line indicates the direction to the target as selected on the map screen by the navigator.

A pilot can maneuver to avoid the enemy: dodging spotlights, and doing a cork-screw to escape ME110 fighters—diving left, pulling up, climbing, then diving to the right. However, if you don't shoot down or escape the fighters, they'll eventually kill your gunners and damage the Lancaster.

Figure 1

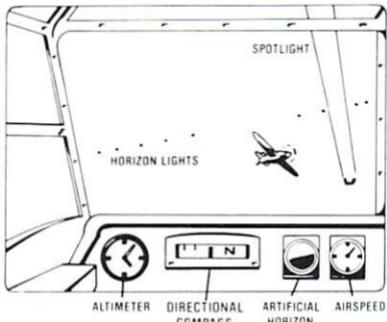


Figure 2



Figure 3



## **Navigator #5**

The beginning player should set his course at the very start of play. The navigator has two different map views. The first shows your current position, with a plane moving across the map. Push the red button to switch to the second view, which displays the navigator's cursor on the map. Move the cursor to the edge of a screen to go to the next map (if there is one in that direction).

Switch to this position at the very start of play, and your cursor will be on a map of England. Go south one screen, and east two screens, to reach the area of Germany with the three dams and their corresponding lakes. Position the cursor on a dam.

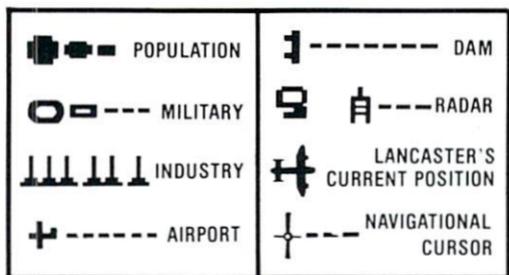
As you move the navigator's cursor, the compass heading at the top of the screen will change—so will the dark reddish marker on your pilot's compass. This shows you the heading to take when you return to the pilot's position.

The six maps of Northern Europe contain colored symbols that stand for major landmarks:

green circles—military installations  
red aircraft—military airport

purple diamond—city  
blue smoke stack—industrial center

Figure 4

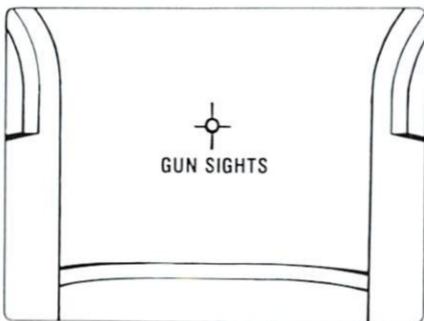


### Front and Tail Gunners (#2 and #3)

Enroute you must shoot barrage balloons as soon as they appear. If not, their lines entangle your craft and you crash. Thus whenever you get a flash for "2" on the bottom of the screen, quickly select the front gunner. Both gunner positions operate much the same, with a cross hair sight (see figure 5).

You must also shoot down enemy fighters. Spray a pattern of bullets left and right. They can be knocked down even at a distance if you're skillful enough.

Figure 5



It's easier to hit searchlights when they first appear in the distance at the top of the screen (they're moving slower). When they're at the base of the screen they're a fast moving, hard-to-hit target. If you don't shoot them, you'll have the dubious pleasure of waiting while they light up your plane and smash you with flak, which eventually damages the plane. If a number of searchlights are coming in succession, it's best to just stay with the front gunner and get as many as you can.

The front gunner controls twin 303 caliber F.N.5 machine guns, and in the rear four F.N.20 303 caliber guns. (See "Bombing" for how the front gunner mans the bomb sights.)

## First Engineer (#6)

The first engineer controls the engines and propellers for the Lancaster. See "Squadron Leader" section for detail on the second engineer (position #7).

The first engineer's screen has four throttles (bottom left), four boosters (bottom right), and corresponding gauges. There's a fire extinguisher (upper right) for each engine (see figure 6).

Figure 6

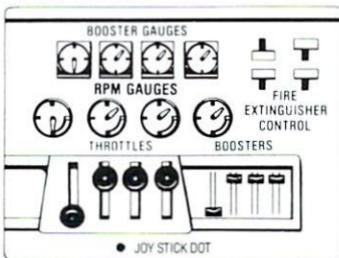


Figure 7 BOOSTER GAUGES



Figure 8



To change throttle or booster settings, place the joystick dot below them, push the red button and hold it down while pressing and press forward or back on the joystick. Position the dot below the center of each group in order to control all four at once.

The throttles are like the accelerator on a car. The boosters (which control the angle or pitch of the blades) are like the gear on a car. Set both high for top speed. These must be in balance for efficient use of power and to avoid over-revving.

An engine is over-revving if the rpm needle is flashing in the red zone. Reduce throttle immediately. If it won't reduce, the engine is on fire. Use the extinguisher before the fire can spread. Place the joystick dot next to the appropriate extinguisher, press the red button and move the joystick down.

Use extinguishers with care. Once an engine is doused, it's permanently out. In order to keep flying straight, decrease throttle on the opposite side. If you extinguish engine number one, reduce throttle on number three or number four. On the Squadron Leader level you can adjust trim. Even losing both engines on a side can be handled by moving the trim to its highest setting.

## Bomb Specialist (#4)

The role of the bombing specialist is to set the preliminary switches (bomb rotator and spotlights) for the bombing run. The spotlights shine down on the water, and when their reflections are just touching each other, the plane is at the right altitude. Timing is crucial, since setting the rotator changes the front gunner function to that of a bombardier. Thus you will have no machine gun defense against frontal attack. However, set the switches too late and you'll miss the target.

## BOMBING STRATEGY

At the very beginning of the bombing run, you must turn the plane so you can get lined up with the dam while still over the land, then fly straight over the lake to the target (see figure 9).

If you're too high as you begin your approach, lower your nose so you're dropping toward 60 feet (see figure 10 for correct setting of altimeter). Then switch to the engineer screen, #6. Position the joystick down in the center beneath the set of throttles, in order to adjust all four at once. Press the red button and tap down on the joystick until the throttle gauges read two o'clock. Do the same for the boosters on the right until their gauges read high noon.

Next, return to the pilot's screen to check your speed. When the blue needle covers the red marker needle at one o'clock, you're flying at 232 mph (see figure 11).

Figure 9

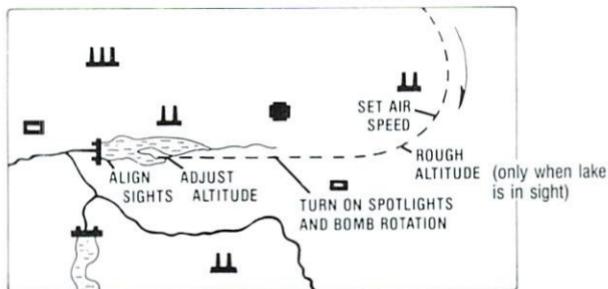


Figure 10



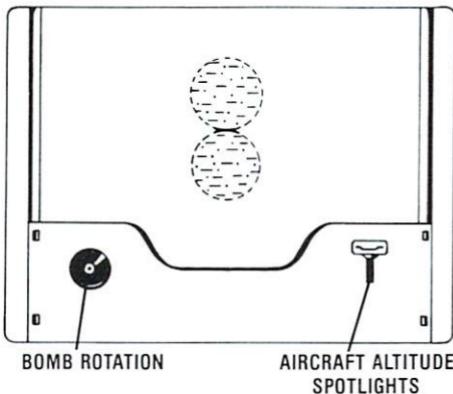
Figure 11



Closer in, the dam appears on the horizon as a blue line. Aim straight for it, and make sure the plane is flying level. Your altitude should be close to 60 feet (altimeter reading 12:40). Periodically re-check your altitude and speed.

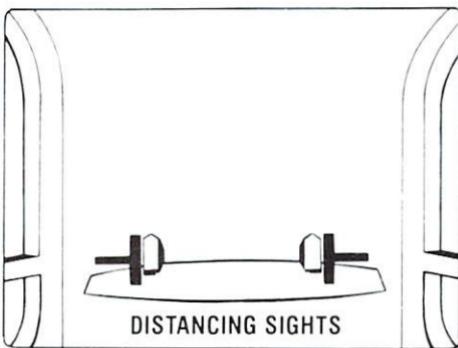
Go to position #4 (see figure 12). Place the joystick dot below the bomb rotation switch on the left, press the red button and push up on the joystick to set the rotator. On the right, throw the spotlight switch the same way. Avoid doing this over enemy territory—it makes you a beacon for enemy gunners. Now go back and forth on the joystick until the two balls of light just touch. Your plane is now at the perfect height of 60 feet. Setting the rotator, change the front gunner function (position #2) to that of the bombardier.

Figure 12



Switch to the bombardier (#2), who is now controlling the bomb sights (see figure 13). When the dam towers are positioned between the bomb sights, and touch them, you are the proper distance from the dam, 800 yards. Press the red button and... bombs away!

Figure 13



With success, the bomb skips over the water above the torpedo nets and hits the crest of the dam, sinking along its face to 300 feet below the surface, which fires the depth-sensitive hydrostatic pistols and sets off the blast (see figures 14 and 15).

If you've missed, try again. Your Lancaster carries several bombs.

**Note:** Even if you're down to three engines you can reach bombing speed. Near the end of the run, set the throttles to maximum. After about 10 seconds the over-revved engines will catch fire. Endeavor to drop the bomb before your plane catches fire.

Figure 14

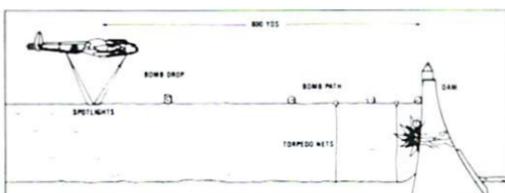


Figure 15



### Status and Damage (#8)

This screen shows your number of flak hits and how you've fared with barrage balloons, fighters and searchlights. Damage to your plane and personnel are indicated.

If your plane crashes, the status and damage screen is displayed.

### Squadron Leader Level

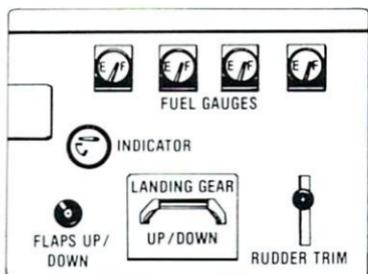
On this level you take off from the runway at Scampton Field, north of London—which involves several adjustments at the second engineer's position (described below).

### Second Engineer (#7)

The second engineer must first set the flaps down for takeoff (see figure 16). The flaps are an extension of the wing that increases the wing area and so gives greater lift. Give the engines full throttle and half boost (position #6).

You will be able to pull up the nose of the Lancaster once takeoff speed is reached (when the airspeed needle points straight up).

Figure 16



Once off the ground, you must lower the throttles and boosters as soon as possible in order not to over-rev the engines. Also retract the landing gear and the flaps to increase airspeed. Pull back slowly on the joystick to increase altitude, and you're off.

The rudder trim on the second engineer's screen adjusts your flight left or right. Moving the joystick up, with the red button pushed, will guide your plane to the right. Moving the joystick down turns the aircraft to the left. Moving the trim to its highest setting will compensate for losing both engines on a side.

Good luck!



War Office,  
10 Downing St.,  
London, W2, England

May 16, 1943

Squadron Leader:

You have been chosen to lead one the Royal Air Force's finest crews in Squadron 617.

During the past months you have risked your life in low-level flying exercises and attack simulations in preparation for this dangerous mission.

By now you will know the targets of this crucial mission—the great power dams of the Ruhr Valley—the Moehne, the Sorpe and the Eder. Destroy these dams and you will have dealt the Axis war machine a deadly blow.

The mission will commence tonight at 21:15 hrs. You will fly in formation led by Wing Commander Guy Gibson.

As you embark on this mission, know that my heart and those of your countrymen are with you.

Good Luck and Godspeed!



Winston Churchill

## REPORT ON THE FORMATION AND TRAINING OF 617 SQDN. WITH NOTES ON THE LOW-LEVEL PERFORMANCE OF THE MODIFIED LANCASTER BOMBER

By Guy Gibson, W/C, RAF.

*Wing Commander Guy Gibson, DSO, DFC, was chosen by Air Marshall Harris as Commanding Officer of "Squadron X". He began assembling the hand-picked crew, some of whom were chosen by Gibson himself, at Scampton Airfield on March 21, 1943. Some of the crew members have completed more than ten operations (an operation is 25 bombing sorties) over enemy territory. Gibson himself has completed 23 operations. The crews range in age from 20 to 32. There are currently 21 pilots serving with 617—three from the Royal Australian Air Force, five from the Royal Canadian Air Force, one from the Royal New Zealand Air Force, and twelve from the Royal Air Force. This last figure includes two U.S.-born Squadron Leaders, Young and McCarthy.*

The speed with which the squadron had to be formed presented various difficulties. Initial facilities at Scampton were quite limited, and indeed, until the arrival of the Type 464 Provisioning Lancasters, only ten aircraft on loan from other squadrons were available to the men. Their accommodations were less than luxurious, being a group of condemned wooden billets of First World War vintage. Each hut housed 24 men. In the interests of bringing the motley group together, it was suggested that each night they do calisthenics before retiring. A newcomer to the crew who arrived one evening in the midst of these exercises was convinced that he had "stumbled on an annex of the local mental institution."

The 700 men of the squadron raided other squadrons for furniture—beds and chairs. With A/V/M Cochrane's intervention, supplies such as uniforms and blankets for the 617 were given top priority. Official pressure resulted in the appearance of spark plugs, tools, starter motors, bomb trolleys and winches.

On March 27, 1943, I was issued with "most secret" written orders, which outlined the plan of attack without naming the targets.

"No. 617 Squadron will be required to attack a number of lightly defended, special low-level targets over enemy territory in moonlight with a final approach to the target at 60 ft. at a precise speed, which will be about 240 mph."

It was noted that the exact speed would be determined later and visibility might well "not exceed one mile". It was assumed that aircraft would be dispatched at ten-minute intervals to attack the first target. When this was destroyed, subsequent aircraft would be diverted in the air to the next target and so we had to ensure that navigation was accurate in moonlight, at a height which would be as secure as possible against fighter attack. Air position indicators would be available, but training was to proceed without them. Accordingly, the squadron has been performing low-level night flying exercises almost non-stop to date. The efficiency attained in these areas has been most gratifying.

According to Barnes Wallis's specifications of the delivery of the bomb, each Lancaster must release the bomb at 240 mph, 60 ft. above water and exactly 800 yds. away from the dam.

Visual sighting at night is difficult to impossible because of the existence of a sort of grey no-man's land between the surface of the water and the aircraft flying so close at high speed. Several different techniques were tried and all were rejected due to measuring error or impracticality. Finally, a simple solution was found, using two spotlights, one at either end of the aircraft. As the aircraft flies over the water the spots shine down upon the surface of the water. The spotlights are angled such that when the two spotlights touch, the aircraft is flying at 60 ft. with virtually no error.

The distancing problem had a similar trivial solution involving angles. The front gunner, using the bomb aimer's bubble, will sight on the twin towers of the dam, through a Y-shaped distancing sight. When the twin towers of the dam align with the markers on the end of the sight, the aircraft is exactly 800 yds. from the dam, again with virtually no error.

The conventional airspeed indicator used by the Lancaster is accurate enough to render an airspeed reading within acceptable tolerances.

Therefore, I have the honour to report that 617 Squadron is, in all respects, ready for battle.

### INTELLIGENCE—TACTICAL REVIEW

prepared by J.A. Franklyn-Smith, S/L (INTEL)

#### GERMAN DEFENSE SYSTEMS

Light anti-aircraft pose formidable problems for low-flying aircraft. The basis for nearly all German 20MM models is the FLAK 30, capable of 120 rounds per minute with a ceiling of around 6630 feet. A wide range of heavier flak guns, including those mounted on concrete towers or formed into mobile railway batteries, will also prove dangerous if the crews stray too close to military or industrial centres.

An integrated defense system manned by the Luftwaffe has been developed in Northern Europe. Coordination from local radar operators directs night fighters, anti-aircraft guns and spotlights.

Two types of German radar detect incoming Allied aircraft and coordinate flak, spotlight and interceptor aircraft.

A) Freya stations on the coast give the direction and range of attackers up to 100 miles but are unable to determine altitude. B) Mobile Wurzburg sets with a range of 45 miles are used by ground controllers inland and many fighters have airborne Lichtenstein sets accurate up to two miles.

So the 617 Squadron Lancasters involved in Operation Chastise must contend with this defensive organization: Fighters with airborne radars, and a strong array of flak weapons assisted by searchlights and radar and often grouped around vulnerable targets.

One advantage to the 617 Squadron is that the German ground radar is ineffective at tracking aircraft below 1,000 feet, especially in the relative haven of valleys near the targets. Also, airborne night fighters equipped with Lichtenstein radar sets are not effective in scanning downwards from their regular operating altitude. Thus, flying as low as possible at night offers the Lancaster the optimal chance of survival.

From the inception of the operation, a Mosquito reconnaissance aircraft has flown daily at 25,000 feet over the dams, taking photographs of rising water and the defenses. The Mosquitos are flown in such a manner that to the Germans it appears they are crossing the dams by accident.

During the afternoon of May 14, a photo-reconnaissance mission was flown at 30,000 feet over targets "in the Soest area", and on the morning of May 15 the Dortmund, Duisburg and Soest regions were photographed so as not to draw attention to the dams. This information was combined with other results to show that there was no unusual activity in the target area.

## CERTAIN ASPECTS OF HARD-CASING EXPLOSIVE BEHAVIOUR AT DEPTH

By B.N. Wallis M.S.E., F.R.S.

### PREFACE:

Current strategic theory holds that the bombing of enemy factories and centres of population beyond the battlefield will cause a collapse of production capacity and severe deterioration in civilian morale. The Air Targets Sub-Committee has identified three targets of special strategic significance: the Moehne, the Eder, and the Sorpe dams. All are in the Ruhr valley and account for the bulk of water supply to the monstrous German arsenal. For example, the German method of iron production needs between 100 and 150 tons of water to produce a ton of steel. These dams also provide domestic water to the Ruhr district.

The Moehne creates Moehne Lake. The level of this lake is maintained so that barges with coal and steel and tanks can travel to and from the foundries. If the dam were to be breached, the reservoir would empty 134 million tons of water in approximately ten hours into the lower Ruhr, causing widespread disaster. There would be a serious shortage of water for drinking purposes and industrial supplies.

The Eder dams the Eder River to form Eder Lake—212 million tons of water. It controls the level of Germany's second most important waterway, the Mittelland Canal, and prevents flooding of surrounding agricultural land and towns. Several power stations lying along the river would be damaged or destroyed by a breach in the dam, and transportation on the Mittelland would be seriously hampered to the point of a virtual cessation of traffic. The Sorpe holds a similar position of importance.

A psychological as well as physical effect will be felt, should the dams be burst. Rumours will circulate regarding disease, water shortage, and loss of firefighting capabilities.

Countervailing arguments were submitted by high-ranking officers of Bomber Command, who drew the Sub-Committee's attention to the massive construction of the German dams, against which existing weaponry would be useless. There was considerable doubt as to whether the structure could be breached even if fissures were made in a gravity-type dam (the Moehne). These dams are also protected by nets against torpedoes.

The Moehne is 112 feet thick at the base, 130 feet high and 25 feet thick at the top. The Eder, also a gravity dam, is even bigger.

It is calculated that the bomb will not ricochet if the angle of impact exceeds 30 degrees, and therefore the best height is 10-15,000 feet. At this height the average error was 102-113 yards (if a 50-yard-long portion of the dam were attacked, only a 6% chance existed of hitting it—this is reduced to 2% during war-time).

Nonetheless, air attacks on reservoirs and dams have been deemed so important that the Air Targets Sub-Committee desires that the issue be "treated as urgent and of pressing importance".

### DEVELOPMENT

It was clear that conventional techniques were unsuitable to the destruction of these very solid objects, and that an unusual approach would be required to solve the problem. Obviously, a kind of "explosive judo" would be needed, to use the vast weight of water behind the dam to assist in its own destruction.

An underwater bomb exploded on the upstream side of the dam would use the water pressure to magnify the shockwave against the dam. Such a bomb would produce a shockwave that would travel through the side of the dam, smashing a hole through the masonry. However, experimentation revealed that if the bomb was even slightly too far upstream from the dam face when detonated, the surrounding water would damp and absorb the shockwave, making the explosion useless. A new delivery system, incorporating both weapons and techniques, was called for.

Early in 1942, I had the idea of a missile, which if dropped on the water at a considerable distance upstream of the dam would reach the dam in a series of ricochets, and after impact against the crest of the dam, would sink in close contact with the upstream face of the masonry. The germ of this idea came from a technique used by one of the greatest naval strategists of all time, Horatio Nelson, who discovered that by skipping cannon shot across the surface of the water it would gain distance and hit the target vessel just above the water line.

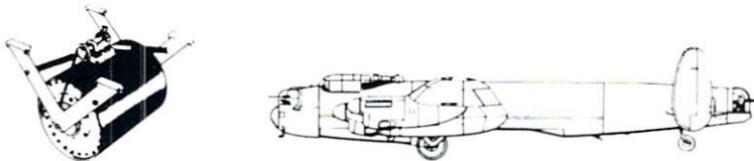
The bomb uses some of the same principles as a rock skipping across the water, but differs in that a rock skipping rotates along its vertical axis while the bomb rotates counterclockwise along its horizontal axis. The essential parameters in delivering such a bomb are airspeed and initial approach angle. In theory, an appropriately constructed bomb capable of being carried by a heavy bomber could be delivered using this principle. Extensive testing has proven this to be correct.

I had projected a near-spherical steel weapon seven and a half feet in diameter. But the Ministry of Supply predicted a two-year wait for steel to make the case, so we settled on a smaller cylinder. The final version of the bomb is approximately 60 in. long and 50 in. in diameter, made of  $\frac{3}{4}$  in. thick steel, weighing 2650 lbs., and containing 6600 lbs. of Torpex underwater explosive compound. There are three pistols, armed with the powerful initiating explosive Tetryl, set to explode at 30 ft., and a fourth self-destructive pistol set to go off 90 seconds after release. Total weight of the weapon is 9250 lbs.

Bomber Command, in the person of Air Marshal Harris, assures me that its personnel and equipment can deliver the weapon on target within the specified parameters. To that end, a special squadron, number 617, has been formed and is currently undergoing intensive training for the exclusive purpose of conducting this single mission. Equipped with modified Lancaster III bombers and carefully selected on the basis of their low-level expertise, the men of 617 Sqn. should have an excellent chance of success. Time, however, is of the essence, since the dams are now filling with water, and will be at the ideal highest level for only a few days in mid-April. I pray the indulgence of Cabinet to expedite this matter with all its powers, as the successful completion of this mission, will, in all likelihood, be the greatest strategic blow for freedom in the entire conduct of the war to date.

## DAMBUSTING BOMB DETAIL

ED825/G carried out test dropping of the cylindrical mines, but was not selected to be one of the attacking aircraft. Underneath can be seen the mine-support pylons and belt drive mechanism for spinning the mine prior to release. The specially fitted .303 can be seen silhouetted just behind the starboard landing gear (British Official).



## LANCASTER B MK I/III (DAMBUSTER)

This modified version of the Mark III has been especially adapted for this mission. The original Mark I/III had H2S radar, a downward looking radar, used to obtain directional bearings from the local landscape. This has been removed in the Dam Buster Lancaster to increase the bomb load capacity. The bombay doors were removed and faired in to allow for two v-shaped caliper arms which protrude from the front of the bombay. These calipers hold the mine between their points and a 20-inch diameter disk mounted on the inside of these extremities engages a track at the end of the cylinder. A hydraulic motor attached to the track (used for steering the hydroplane operator in submarines) is mounted on the floor of the fuselage. This motor is used to spin the mine backwards at the required 500 rpm.

### SPECIFICATIONS OF THE LANCASTER MK III

**Crew** Seven

**Powerplant** Four Rolls-Royce Merlin 24s

### Dimensions

**Span** 102 ft.

**Length** 59 ft. 6in.

**Wing Area** 1,300 sq ft.

### Weights

**Empty** 37,000 lb.

**Normal Load** 65,000 lb.

### Performance

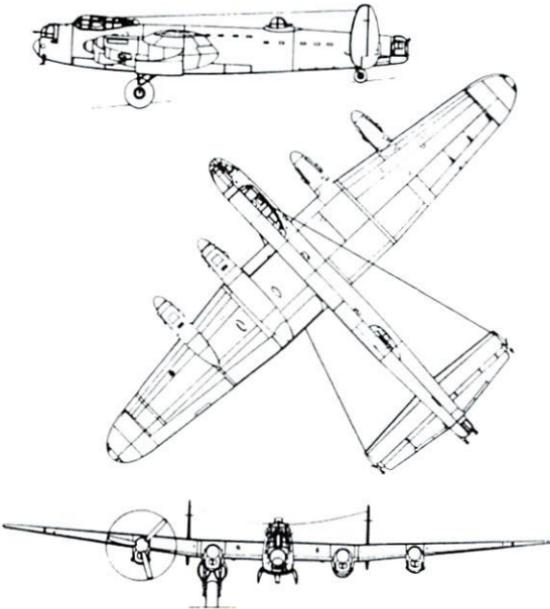
**Max. Cruising Speed** 275 mph

**Service Ceiling** 24,500

(with special superchargers)

**Range** 2,530 miles with 7,000 lb. load  
1,730 miles with 12,000 lb. load

**Armament** Eight 0.303 machine guns  
Two in nose turret  
Two in dorsal turret  
Four in tail turret



## **Limited Warranty for Disk Media**

Accolade warrants to the original purchaser of this computer software product that the recording medium on which the software programs are recorded will be free from defects in materials and workmanship for ninety days from the date of purchase. Defective media that has not been subjected to misuse, excessive wear, or damage due to carelessness and that is returned during that ninety day period will be replaced without charge.

Following the initial ninety day warranty period, defective media will be replaced for a replacement fee of \$10.00.

The defective media should be returned to:

**Accolade  
20833 Stevens Creek Blvd.  
Cupertino, CA 95014  
(408) 446-5757**

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